

# NASA Advisory Council Recommendation

## Technology Infusion in Small to Medium Class Science Missions 2014-02-04 (TIEC-01)

**Name of Committee:** Technology, Innovation and Engineering Committee

**Chair of Committee:** Dr. William Ballhaus

**Date of Council Public Deliberation:** July 31, 2014

**Short Title of Recommendation:** Technology Infusion in Small to Medium Class Science Missions

**Recommendation:** The Council recommends that the Space Technology Mission Directorate (STMD) Associate Administrator and Science Mission Directorate (SMD) Associate Administrator engage with each other and their communities to determine how policies and procedures could be modified to allow the infusion of new mission-enabling and mission-enhancing technologies developed by Principal Investigators, STMD or others in small to medium class missions. Once appropriate policies and procedures have been defined, formulate an implementation plan that assures that the selection decision process is consistent with those policies and procedures.

**Major Reasons for the Recommendation:** In highly competitive program solicitations, such as Discovery and Explorer, there is a disincentive to propose new technology because of the perceived risk. As a result, NASA may be missing an opportunity to leverage scientifically beneficial technology through small and medium science missions. In the long-term, this could erode NASA's scientific and technical capabilities. If the Agency wants to encourage and infuse appropriate new technologies in its small and medium class missions, it must develop a policy that provides a pathway to the inclusion of these technologies in the solicitation release.

**Consequences of No Action on the Recommendation:** Erosion of NASA's science and technical capabilities.

## **NASA Response:**

Although we understand and agree with its intent, NASA does not concur with the specificity of this recommendation. We believe the current policies, plans, and implementation strategies provide deliberate pathways for the inclusion of new and innovative technology for all mission classes. SMD and STMD work closely on technology investments for future missions through both competitive and strategic initiatives. In addition, SMD has specific technology programs in each of its science divisions that are funded through competitive solicitations to advance technology for future mission. SMD and STMD welcome the opportunity to brief the committees jointly or separate on the current policies and procedures that already support an aggressive effort for technology infusion activities into SMD's programs. The following elaborates in more detail the extent of current SMD technology investment activities within the Directorate and with other external partners.

In recent years SMD has increased its technology investments and its collaboration with STMD to help facilitate infusions of new, mission-enabling and mission-enhancing technologies for small-to medium-class missions. The Agency believes these actions have addressed many of the concerns raised by the Council. NASA believes its current policies on Discovery and Explorer solicitations and selection adequately allow for the infusion of new technology and acceptance of associated risks at a level commensurate with the nature of those programs. The following are examples of technology infusion in recent Discovery and Explorer solicitations, as well as other efforts.

## **NASA Response: (continued)**

...Similarly in the Astrophysics and Heliophysics Divisions, the Explorers program benefits from an effective technology value chain that identifies technology gaps, mitigates those gaps through technology development solicitations, and subsequently makes use of suborbital experiments to mature technologies in preparation for use on Explorer-class missions... In Heliophysics, the legacy Reuven Ramaty High Energy Solar Spectroscopic Imager (RHESSI) and the EUV Variability Experiment on the Solar Dynamics Observatory (SDO-EVE) both made extensive use of suborbital assets to raise their instrument Technology Readiness Levels (TRLs) and retire risk. More recently the Heliophysics Low-Cost Access to Space (LCAS) program solicited the Heliophysics Technology and Instrument Development for Science (H-TIDeS) for science and/or technology investigations on suborbital or CubeSat platforms and state-of-the-art instrument technology development specifically for infusion on future missions...

NASA agrees that a proactive focus on technology development and demonstration is of critical importance, which is why our existing planning and policies specifically encourage innovation in our completed missions. We will continue to work within the existing framework to explore additional constructive opportunities within our respective budget constraints. Furthermore, NASA welcomes additional discussion on this topic that might further refine the existing policies and procedures. SMD and STMD welcome the opportunity to brief the committees jointly or separately on the current policies and procedures that already support an aggressive effort for technology infusion activities into SMD's programs, which find approach to infuse mature, yet un-flown technology into new missions.